



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/849,519	05/20/2004	Hiroo Takizawa	Q81712	7137
65565	7590	09/25/2008		
SUGHRUE-265550				
2100 PENNSYLVANIA AVE. NW				
WASHINGTON, DC 20037-3213				
EXAMINER				
ANGEBRANDT, MARTIN J				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
09/25/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/849,519

**Applicant(s)**

TAKIZAWA, HIROO

**Examiner**

Martin J. Angebrandt

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8, 10, 12, 14-21 and 24-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10, 12, 14-21 and 24-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

1. The response of the applicant has been read and given careful consideration. Response to the arguments are presented after the first rejection to which they are directed. The rejections of the previous office action not repeated below are withdrawn based upon the amendment to claims 6 or 19.
2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 5,14,17-19,21 and 24 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Smothers et al. '977.

See examples, where Vinac B-100 is a binder, sartomer and photomer are monomers, o-Cl-HABI is a photoinitiator and the sensitizers is S-3 (table II). See also table III. The addition of S-1, S-2 or S-3 sensitizers to the composition disclosed in column 19 which includes a binder, tracrlyate and trimethacrylate monomers, o-Cl-HABI as the initiator and leuco crystal violet

(columns 19 and 20). After imaging exposure these are flood exposed using UV/Vis from a mercury arc lamp, heated and the diffraction efficiency measured (17/67-18/14). The examples using the composition with added sensitizers S-3, S-5 or S-6 in columns 19-20 anticipate the claims.

Note that claim 20 does not require a two photon exposure, merely use of the recited composition with an exposure process. The two photon exposure limitation does not appear until claims 25 and 26, so it is clear that single photon exposures are embraced by the claims rejected under this heading. As the diffraction is induced by the refractive index change and is relatable to the refractive index change, the examiner holds that this measurement inherently is a measurement of the refractive index change. This is congruent with the measurement recited in claim 15 of the instant application.

The response does not seem to understand two photon absorption. There is an energy difference between the ground state of the compound and the excited state. Excitation to the excited state occurs when the incident light energy absorbed by the compound is equal to this energy difference and can occur by a single photon absorption equal in energy to this difference or the simultaneous absorption of several photons the sum of whose energy is equal to the energy difference. The applicant argues as if being able to undergo a two photon absorption precludes single photon absorption. This is not the case, neither is the converse. **With respect to Smothers et al. '977, the applicant should compare the structure of dyes S-3 of Smothers et al. '977 and dye D-74 of the instant application. These are the same dye.** With respect to claims 20 the language states "... performing a recording by using a two photon absorbing polymerizable composition described in claims 19....". The claims does not describe the

recording process, merely a functional property of the composition. It certainly does not limit the type of information recorded or the process used.

The dyes used in the cited examples are both cyanine dyes and bounded by formula 1 where the heterocyclic of formula 2 is used. (so three methine units on either side of the carbonyl moiety).

The claims rejected under this heading are to the composition, not the methods and therefore the coverage sought is broader than the intended use. Compositions bounded by the claims are exemplified and therefore anticipate the rejection claims. The applicant's representative fails to appreciate that the ground state of the sensitizer and the excited state have a specific energy difference and that the excited state can be reached either through single or multiphoton processes. The applicant fails to address that fact that the same sensitizers are found in the prior art reference and the instant application. The rejection stands.

5. Claim 19-21 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akiba et al. JP 2003-073410.

Akiba et al. JP 2003-073410 teaches that hyperfine three dimensional polymerized structure using two photon excitation [0001]. The reaction only occurs within the focal volume of the laser. [0002]. The use of cyanine dyes is taught (see dyes 13, 14, 27,28,41,42,55,56,69,70,83,84,97,98,111,112,125,126 and 139-140 in tables. Note that dye 13 is almost identical to sensitizer S-1 of Smothers et al. '977 and dye 41 is almost identical to sensitizer S-5 of Smothers et al. '977. The two photon dye can be used with either free radically or cationically polymerizable materials which may include binders and other additives [0037-

0040]. The use of various lasers, including those operating at 620-680,780, ~1000 and 1053 nm is disclosed. [0041-0042]. See examples 1 and 2.

It would have been obvious to one skilled in the art to modify the cited examples including the two photon absorber by adding a binder based upon the direction at [0039-0040] with a reasonable expectation of forming a two dimensional image.

The applicant fails to appreciate that the polymer resulting from polymerization of the monomers and the original monomers inherently have different refractive indices and that the three dimensional exposure is required in the reference to form the three dimensional molding. Further, the dye added to claims 19 is met by the dye used in the examples, and/or disclosed in table 1 of the reference.

The argued position neglects the fact that all monomer will have a different refractive index from a polymer formed from them due to the difference in polymerization/crosslinking density and the different chemical structure of these compounds/polymers. Fick's law of diffusion applied to all chemical systems as well. Smothers teaches the diffusion in photopolymer systems for all photopolymeric systems. Note that claims 20 and 21 lack the limitations found in claims 1-3.

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined

application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1-8, 10, 12, 14-21 and 24-27 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 11/510656 (US 2007/0048666). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims both embrace the heating to develop latent image into a refractive index image.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The applicant declines to respond at this time to the ODP rejections. The difference in refractive index is inherent due to the difference in the chemical structure of the different compounds/polymers. This reference claims recite both heating and uniform exposure.

8. Claims 1-8, 10, 12, 14-21 and 24-27 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-40 of copending

Application No. 10/874344 (US 2005/0003133). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims both embrace the development of the latent image into a refractive index image and in particular the coloration of the leuco dye using the two photon exposure.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The applicant declines to respond at this time to the ODP rejections. The difference in refractive index is inherent due to the difference in the chemical structure of the different compounds/polymers. This reference claims recite both heating and uniform exposure.

9. Claims 1-8, 10, 12, 14-21 and 24-27 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 & 3-19 of copending Application No. 10/925086 (US 2005/0058910). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims both embrace a composition including a two photon absorber, a photoinitiator, a polymerizable compound and binder and the use thereof with a second treatment to develop the latent image.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The applicant declines to respond at this time to the ODP rejections. The difference in refractive index is inherent due to the difference in the chemical structure of the different compounds/polymers. This reference claims recite both heating and uniform exposure.

10. Claims 1-8, 10, 12, 14-21 and 24-27 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 5-18 of US patent 7112616.



Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims both embrace a composition including a two photon absorber, a photoinitiator, a polymerizable compound and binder.

**The provisional nature is withdrawn based upon the patenting of this application.**

11. Claims 1-8,10,12,14-21 and 24-27 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-29 of copending Application No. 11/360439 (US 2006/0194122). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims both embrace a composition including a two photon absorber, a photoinitiator, a polymerizable compound and binder.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The applicant declines to respond at this time to the ODP rejections. The difference in refractive index is inherent due to the difference in the chemical structure of the different compounds/polymers. This reference claims recite uniform exposure.

12. Claims 1-8,10,12,14-21 and 24-27 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-21 of copending Application No. 11/509563 (US 2007/0047038). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims both embrace a composition including a two photon absorber, a photoinitiator, a polymerizable compound and binder.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The applicant declines to respond at this time to the ODP rejections. The difference in refractive index is inherent due to the difference in the chemical structure of the different compounds/polymers. This reference claims recite both heating and uniform exposure.

13. Claims 1-8,10,12,14-21 and 24-27 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-23 of copending Application No. 11/359566 (US 2006/0188790). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims both embrace a composition including a two photon absorber, a photoinitiator, a polymerizable compound and binder.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The applicant declines to respond at this time to the ODP rejections. The difference in refractive index is inherent due to the difference in the chemical structure of the different compounds/polymers. This reference claims recite uniform exposure.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebrannndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Martin J Angebranndt/  
Primary Examiner, Art Unit 1795

Martin J Angebranndt  
Primary Examiner  
Art Unit 1795

01/10/2008

